Simon Kwong

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Education

University of California Santa Cruz — Santa Cruz, CA
Bachelor of Science in Computer Science — *Aug. 2020 – June 2024*

Relevant Coursework: Computational Models, Computer Architecture, Analysis of Algorithms, Principles of Computer System Designs, Artificial Intelligence, Database Systems, Fullstack Web Development

Experience

Tutor — January 2023 – June 2024
University of California Santa Cruz — *Santa Cruz, CA*
- Helped students develop an understanding of basic data structures and algorithms
- Taught students how to debug code and write unit tests

Grader — January 2023 – June 2024
University of California Santa Cruz — *Santa Cruz, CA*
- Assisted in grading programming assignments and exams of a large scale class of upwards of 400 students
- Assisted in proctoring exams of large scales classes

Projects

UCSC-Amazon | *Node, Express, React, Postgres* — April 2024 – June 2024
- Developed an e-Commerce application with product catalog, user accounts, cart functionality, and checkout, enabling customer purchasing with product inventory management.
- Created and integrated RESTful APIs and GraphQL for seamless communication between the frontend and backend systems.
- Created backend using microservices architecture to manage products, user accounts, facilitate secure payment processing, and order history which allows for easy maintainability, scalabity, and better management.

Slack Clone | *Node, Express, React, Postgres* — March 2024 – April 2024
- Built a real time messaging platform built with a React frontend and Express backend enabling consistent communication with multiple users.
- Implemented multi-channel communication system with PostgreSQL database supporting workspace management, channel management, and file upload.

Multithreaded HTTP Server | *C, HTTP Requests* — May 2023 – June 2023
- Built multithreaded HTTP server in C utilizing thread-safe data structures to handle concurrent client requests.
- Implemented thread synchronization and mutual exclusion for safe concurrent access to shared resources.
- Designed custom queue data structure with mutexes for thread-safe request processing which ensures no race conditions or deadlocks occur.

Huffman Coding | *C* — January 2022 – March 2022
- Developed a complete Huffman Coding file compression system in C that processes input from stdin and files, achieving lossless data compression with configurable output to stdout or specified files.
- Implemented frequency analysis and priority queue data structures using custom binary heap operations, enabling optimal Huffman tree construction for efficient character encoding

Schmidt-Samoa Cryptosystem | *Python* — January 2025
- Built an implementation of the Schmidt-Samoa Cryptosystem with encryption, decryption, and key generation functionality in Python.
- Generated large pseudorandom prime numbers by checking with the Miller-Rabin primality test for secure public and private keys.
- Built encryption/decryption functions utilizing number-theoretic operations which ensure message security.

Technical Skills

Languages: Python, C/C++, SQL (Postgres), JavaScript/Typescript, HTML/CSS, Go
Frameworks: Node.js, React, Express, NextJS, Shadcn, TailwindCSS
Developer Tools: Git, Docker, Postman, Vim, Bash, Unix